

The mean annual secular change observed, $8' 5''\cdot72$ declination diminishing, is larger than that determined by Sir E. Sabine, which was $7' 39''$; but this is only in accordance with the opinion expressed in the former paper, where it is shown that the secular change is a variable one, and is probably now becoming progressively more rapid.

The semiannual inequality is also largely increased, being now $81' 80''$, whereas between 1857 and 1862 it was only $58''\cdot85$; possibly part of this difference may, however, be due to the fact of the observations now under notice having only been made at isolated periods, whilst the latter result was obtained from the hourly readings of the magnetograph recording the declination continuously.

The observations discussed in this paper have been made and reduced by Mr. G. M. Whipple, B.Sc., Magnetic Assistant, and Messrs. Callum, Power, and Figg, observers, under his supervision.

III. "Contributions to the Minute Anatomy of the Thyroid Gland of the Dog." By E. CRESSWELL BABER, M.D. Lond. Communicated by Dr. KLEIN, F.R.S. Received December 9, 1875.

(Abstract.)

The minute structure of the thyroid gland generally, and of its lymphatics in particular, are subjects still but imperfectly understood. With the view of elucidating the latter, the following research was made on the thyroid gland of the dog. The research was carried out under the direction of Dr. Klein. On injecting the lymphatics of this organ with Berlin blue, by the method of puncture, they present the following characters :—

Traversing the gland, chiefly in a longitudinal direction, are large *lymphatic vessels* provided with valves. In direct connexion with these, and permeating the gland in all directions, is a dense meshwork of *lymphatic tubes* and *spaces*. The smaller lymphatic tubes run between individual gland-vesicles, the larger between groups of the same. They accommodate themselves accurately to the intervals left between the vesicles, and where the intervals are larger they expand into irregularly shaped lymphatic spaces. They present no appearance of terminating in blind extremities as stated by some authors. Injections with nitrate of silver show the lymphatic vessels, tubes, and spaces to be all lined with a continuous layer of endothelial plates.

During this investigation it became necessary to study more carefully the interalveolar tissues. This led to the discovery in them of a tissue which does not appear to have yet been described. This tissue, which is designated by the author by the name of "*parenchyma*," consists of large rounded cells, each provided with an oval nucleus, found either singly or in groups amongst the epithelial cells. From

appearances presented by the parenchymatous cells, the author concludes that they originate external to the vesicles by exerting pressure on the epithelial wall of the vesicles; they then produce a flattening and absorption of the same, and finally make their way through it into the interior of the vesicle.

The author in conclusion points to the *morphological identity* existing between the contents of the lymphatics and those of the vesicles—the contents, namely, of both appear during life to be a viscid substance which, in sections of hardened specimens, present a like morphological aspect, and stain in a similar manner with reagents. This identity, if proven in other respects, will go far to show that one, possibly the chief, function of the thyroid gland is the formation in the vesicles of a material which is carried by the lymphatics into the general circulation.

This paper is accompanied by nineteen drawings illustrative of the lymphatics and parenchyma of the glands.

IV. "Research on the Minute Anatomy of the Alimentary Canal."

By HERBERT WATNEY, M.A., Demonstrator of Microscopical Anatomy at St. George's Hospital. Communicated by Dr. KLEIN, F.R.S., Assistant Professor in the Brown Institution. Received December 16, 1875.

(Abstract.)

This research was commenced and carried on for the first fifteen months under the direction of Dr. Klein; during the last year it was continued independently.

Chapter I. describes the minute anatomy of the mucous membrane of the small intestine and the method of fat-absorption.

The author commences the Chapter by giving a history of the researches of previous observers, and the methods he employed for hardening and staining the tissue. He then gives a description of the minute structure of the mucosa.

The following are the results obtained.

1. The epithelium.—Lymph-corpuscles are constantly found among the epithelial cells of the intestine. Further it is found that the epithelium contains a reticulum continuous with the reticulum of the mucosa; this reticulum appears in horizontal sections of the epithelium as small branched cells, which sometimes show a nucleus. In vertical sections the reticulum is seen as a dark line at the base of the epithelium, and from this dark line fine processes run among the epithelial cells. The reticulum is stained very deeply by chloride of gold or by hæmatoxylin.

In teased preparations, if the epithelial cells are isolated, shreds of the reticulum are seen to be attached to the separate cells.

The epithelial cells are described as being closed at their free extremities.